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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,958	12/18/2001	Melisa Buie	AMA/4213.P1/ETCH/METAL/JB	3439

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APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,958

Applicant(s)

BUIE ET AL.

Examiner

Kin-Chan Chen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kornblit et al (US 5,948,570; hereinafter "Kornblit") In view of Meyer et al. (US 4,600,686; hereinafter "Meyer").

In the method of etching chromium or chromium-containing compound that can be used for reticles, Kornblit (abstract; col. 2, lines 11-20; col. 3, lines 40-50) teaches that the structure may comprise a metal (e.g., chromium or chromium-containing compound) photomask layer formed on a silicon-based substrate and a patterned resist material deposited on the metal photomask layer. Oxygen and chlorine may be used. The power may be delivered to the processing chamber to generate a plasma. The exposed portions of the metal photomask layer may be removed. Kornblit teaches etching process for rectiles therefore positioning the rectile on a support member in a processing chamber is expected in order to perform etching process.

Unlike the claimed invention, Kornblit does not teach that carbon monoxide may be used to etch chromium-containing compound. In a method for making photomask of chromium coated glass substrate, Meyer teaches that a processing gas comprising carbon monoxide and the chlorine containing gas may be introduced into the chamber. The carbon monoxide and the chlorine containing gas may have a molar ration between about 1:9 and about 9:1. The power may be delivered to the processing chamber to generate a plasma. The exposed portions of the metal photomask layer may be removed. The metal photomask may comprise chromium. The substrate may be a transparent silicon based material (e.g., quartz). The processing gas may comprise oxygen. The processing gas may comprise an inert gas. See Figs. 1 and 2; col. 3, lines 3-25. Meyer teaches that the structure being processed comprises a metal photomask layer formed on a silicon-based substrate and a patterned resist material deposited on the metal photomask layer. Therefore, it would have been obvious to one with ordinary skilled in the art that the reticle is included because it is one of the most popular photolithographic tool (photomask) having said structure in the semiconductor device fabrication, see Yasuzato et al. (US 5,750,290; col. 1, lines 21-30) in the record as evidence. Hence, it would have been obvious to one with ordinary skilled in the art to modify Kornblit by using carbon monoxide as taught by Meyer because each of which is taught by the prior art to be useful for the same purpose of etching chromium coated glass substrate.

“ It is prima facie obvious to use two compositions (two methods) each of which is taught by the prior art to be useful for the same purpose. ” In re Kerkhoven 205 USPQ

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1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

As to dependent claim 6, they are well-known chlorine-containing gases for etching chromium-containing material, see Yasuzato et al. (US 5,750,290; col. 2, lines 13-15) in the record as evidence.

The use of conventional materials to perform their known functions in a conventional process is obvious. In re Raner 134 USPQ 343.

The above-cited claims differ from Meyer by specifying various compositions (e.g., ratios of the etching gases), processing parameters (such as claims 9,10,13,16-20, 23, and 24). However, They are commonly determined by routine experiment. The process of conducting routine optimizations so as to produce an expected result is obvious to one of ordinary skill in the art. In the absence of showing criticality, it is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify the prior art by performing routine experiments (by using various compositions and different processing parameters) to obtain optimal result in order to provide their art recognized advantages and produce an expected result. It is noted that applicant did not traverse the aforementioned conventionality (e.g., well-known features, obviousness), which have been stated in the previous office action (October 20, 2003).

Response to Arguments

3. Applicant's arguments filed January 23, 2004 have been fully considered but they are not persuasive.

Applicant has argued that Meyer does not teach using chlorine gas and Kornblit does not teach using carbon monoxide in etching a chromium layer. It is not persuasive.

One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Merk & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant has argued that the combined prior art does not teach chlorine-containing gas recited in claim 6. It is not persuasive. As has been stated in the office action, Yasuzato et al. (US 5,750,290; col. 2, lines 13-15) teach that it is well known to use chlorine-containing gas (e.g., **BCl₃ or chlorine**) for etching chromium containing material.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yasuzato et al. (US 5,750,290; col. 1, lines 21-30) teaches that photomask may include reticle in the semiconductor device fabrication. Yasuzato et al. (US 5,750,290; col. 2, lines 13-15) also teach that it is well known to use chlorine-containing gas (e.g., **BCl₃ or chlorine**) for etching chromium-containing material.

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5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 8, 2004



Kin-Chan Chen
Primary Examiner
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